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# VIOLENCE BEGETS VIOLENCE… BUT HOW?

# A DECISION MAKING PERSPECTIVE ON THE VICTIM-OFFENDER OVERLAP

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**ABSTRACT**

This study applied a decision making perspective to examine the causal mechanisms underlying the relation between violent victimization and offending. We theorized that having been victimized affects an individual's appraisal of subsequent potentially conflictive situations in such a way that victims become more attuned towards the benefits of violence perpetration than towards its costs. Furthermore, we argued that this altered appraisal mediates the relation between violent victimization and violent offending. We tested these hypotheses using data from the Zurich Project on the Social Development of Children and Youths, a longitudinal study of Swiss youth ($N$ = 1,013; age 11-15). In line with expectations, path analysis results showed that prior victimization influenced the appraisal of decision making situations which, in turn, predicted subsequent self-reported violent offending. Importantly, these mediation effects held when controlling for a variety of time-stable factors, such as self-control and risky activities, as well as prior victimization and delinquency. Implications for research and theorizing on the victim-offender overlap are elaborated in the discussion.

KEYWORDS: victimization, violence, victim-offender overlap, decision making, longitudinal study

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## INTRODUCTION

Prior research has demonstrated a strong association between violent offending and victimization. Victims of violence are likely to commit violent acts themselves and, conversely, offenders have a relatively high probability of being victimized (see Jennings, Piquero, and Reingle, 2012, for a review). Whereas the victim-offender overlap is a highly robust empirical research finding, theoretical explanations for it have been less forthcoming (Lauritsen and Laub, 2007). Several theorists have argued that the relation between victimization and offending is spurious as a common third factor, such as low self-control (Gottfredson and Hirschi, 1990), underlies both. Others, however, maintained the relation is causal (e.g., Lauritsen, Sampson, and Laub, 1991). While there is empirical evidence for both positions, important questions remain. Specifically, as Lauritsen and Laub (2007) remarked, in order to move the debate forward research must go beyond the commonly examined factors such as demographic characteristics, risky lifestyles, deviant peers, subcultural norms, and neighborhood characteristics, and also examine aspects of decision making. This was the goal of the present study.

We addressed the causal mechanisms underlying the victim-offender overlap by examining how victimization alters people's appraisal of (subsequent) potentially conflictive situations. Our approach drew from both choice theories of criminal decision making and appraisal theories of emotion, and was premised on the idea that a full understanding of why violent offending follows victimization requires an appreciation of the actual choice process and its antecedents, an assumption that has thus far received little empirical and theoretical attention. We posited that prior victimization influences how the reward parameters, i.e., the perceived costs and benefits of acting violently, are evaluated in such a way that people

become more attuned towards the benefits than towards the costs. This altered situational appraisal, in turn, influences the likelihood of subsequent offending.

We tested this mediation hypothesis using an encompassing longitudinal dataset that allows for disentangling the temporal sequence of victimization and offending. In addition, we employed a method that allows for testing whether *changes* in the choice process are actually due to the victimization event itself instead of due to pre-existing differences between victims and non-victims, such as a latent proneness towards victimization. Specifically, we controlled for an extensive set of potentially confounding variables, including a latent disposition for involvement in crime (i.e., prior offending, prior victimization, and prior decision making), as well as self-control, anxiety and depression, parenting, and risky lifestyles, thus ruling these factors out as alternative explanations.

## A DECISION MAKING PERSPECTIVE ON THE VICTIM-OFFENDER OVERLAP

Whereas most research on the victim-offender overlap has focused on the effect of delinquency on subsequent victimization, the present study adds to a growing body of research that examines victimization as a cause of delinquency.[1] Several studies have shown that prior victimization increases the likelihood that an individual will resort to violent behavior at a future point in time (e.g., Berg et al., 2012; Manasse and Ganem, 2009; Turanovic and Pratt, 2013). While this relation appears to be well-established, it is unclear why this is exactly the case, as existing theoretical perspectives fall short of explaining the mechanisms underlying these findings. As Turanovic and Pratt (2013:322) observed, "departing from the victim-offender overlap literature and viewing the sequence in reverse – where the causal ordering begins with victimization – may require examining the relationship between victimization and offending through an entirely different theoretical lens." The lens

[1] Note that we did not consider a decision making perspective to explain the effect of offending on later victimization, as victimization does not imply a choice process. Analyses not reported here confirmed our intuition that decision making characteristics do not mediate the effect of offending on victimization.

used in the present article zoomed in on the choice process, focusing on characteristics of the decision making situation to capture the causal link between victimization and offending.

## CRIMINAL CHOICE, RATIONAL CHOICE, AND APPRAISAL PERSPECTIVES

According to most criminological choice models, decision making involves a cognitive cost-benefit analysis (Clarke and Cornish, 1985; Cornish and Clarke, 1986; Tedeschi and Felson, 1994). These perspectives are faithful to the utilitarian notion that offenders are essentially economic actors who weigh costs against benefits prior to arriving at a decision to engage in crime. While there is ample evidence that perceived costs and benefits are correlates of crime, rational choice-based models are restricted in their ability to account for motivations to engage in crime and the factors that give rise to differential evaluations of costs and benefits by different people. To address some of the limitations of these models, there has recently been an increased interest to broaden choice models to also incorporate emotions (see Van Gelder et al., 2014). Indeed, extant psychological and judgment and decision-making research shows that emotions have strong motivational properties (Lerner and Tiedens, 2006; Loewenstein et al., 2001; Slovic et al., 2005) and may have evolved to shorten decision making processes (Cosmides and Tooby, 2013).

Viewing criminal choice also as an emotion-driven process may be particularly useful for shedding light on the mechanisms behind the victim-offender overlap, as violent victimization tends to be an emotion-laden event, and typically one eliciting negative rather than positive emotions such as feelings of anger and injustice and related emotional experiences such as a desire for compensation or retribution (Orth, Montada, and Maercker, 2006; Kilpatrick, Resick, and Veronen, 1981; Riggs et al., 1992).

Prior criminological studies that alluded to the role of feelings as explanations for the victim-offender overlap have mainly drawn from General Strain Theory (GST) (e.g., Agnew, 2002; Manasse and Ganem, 2009; Turanovic and Pratt, 2013). GST specifies that strains

generate negative emotions, such as anger and frustration, creating a 'pressure for corrective action', which may take the form of crime (Agnew, 1992). The types of strains that are most likely to result in delinquency are those that are unjust, high in magnitude, associated with low social control, and creating some type of pressure or incentive to engage in criminal coping by influencing the availability and appeal of criminal and noncriminal coping options. A serious instance of victimization meets all four criteria (Agnew, 2002).

There is empirical evidence in support of these assumptions. For example, Hay and Evans (2006), using longitudinal data from the National Survey of Children, found support for the idea that the relation between victimization and delinquency is partially mediated by trait anger. More recently, Turanovic and Pratt (2013), also using panel data, found that victimization was associated with higher levels of substance use, which they used to measure maladaptive coping, which in turn was found to be associated with higher levels of offending. However, even after controlling for substance use, victimization remained a strong and independent predictor of later offending, which begs the question what other factors account for this relation. Moreover, while these studies have enhanced our knowledge of the relation between victimization and offending and alluded to the influence of emotions, they have treated them as relatively enduring dispositions, not as factors that operate in the moment of decision making. They thus yield little information about the actual choice process. What is still lacking, in other words, is the notion of people making choices or 'human agency' (Nagin, 2007). We argue that it is precisely the choice process that may help explain the nexus between victimization and offending.

In sum, whereas rational choice-based perspectives shed light on the decision process, these frameworks fall short in explaining why victimization would lead to an altered cost-benefit perception of potentially conflictive situations and the motivation to engage in violence. The prior work that did allude to the role of emotion, most notably anger, to explain the link between violent victimization and offending has examined it as a relatively stable

disposition. In the present study, we drew from appraisal perspectives (e.g., Ellsworth and Scherer, 2003; Smith and Ellsworth, 1985) to understand how prior victimization motivates people towards using violence. Specifically, we addressed the question whether victims of violence become more attuned towards the benefits of violence perpetration than towards its costs and hence become predisposed towards the use of violence themselves.

## THE EFFECTS OF VICTIMIZATION ON THE CRIMINAL CHOICE PROCESS: AN APPRAISAL PERSPECTIVE

According to appraisal theorists, emotions arise from the perception and interpretation of our circumstances and carry information about ourselves and the state of the world around us (Ellsworth and Scherer, 2003). Furthermore, emotions are adaptive in the sense that "in order to survive, an organism cannot simply understand its situation, it has to be motivated to do something about it" (Ellsworth and Scherer, 2003:572). An appraisal therefore triggers certain specific tendencies to respond to the eliciting stimuli (Frijda, 2007, 1988; Smith and Ellsworth, 1985). Angry individuals, for example, tend to perceive a situation as less risky than fearful individuals do (see e.g., Lerner and Keltner, 2000, 2001; Smith and Ellsworth, 1985). Anger, consequently, can facilitate violent action, while fear is likely to inhibit it.

Victims' appraisals of violent situations may trigger different, even opposite, behavioral responses. Victimization may militate against the use of force if it, for example, leads to a higher perceived probability of retaliation and an increased sense of vulnerability. In this case victimization results in a *lower* likelihood of subsequent offending (Cook, 1986; Hindelang, Gottfredson, and Garofalo, 1978; Ousey, Wilcox, and Fisher, 2011). Although a direct longitudinal test of this assumption is, to our knowledge, lacking, there are some studies that suggest empirical support for it. For example, in their interview study with drug dealers, Jacques and Wright (2008) found that victimization can mark a turning point towards the termination of offending. The negative consequences of victimization, including financial

losses and injury, contributed to this. Furthermore, Lejeune and Alex (1973:273) found that mugging victims displayed 'a new sense of vulnerability [and] an awareness of the self as a potential target' after the crime.

However, victimization and the accompanying blow to one's self-esteem, desensitization, and loss of status may also trigger a more positive attitude towards the use of violence in subsequent situations and therefore result in a *higher* likelihood of offending. According to this line of reasoning, violent offending is a way of coping with the negative consequences of victimization. Feelings of anger and injustice and a desire for retribution can lead to a higher anticipated satisfaction from behaving violently, lower moral objections, and lower levels of anticipated guilt and shame to (re)act in hostile and aggressive ways (e.g., Agnew, 2001; Eisner, 2009; Van Gelder, Elffers, and Reynald, 2014). Although, to our knowledge, no prior studies have tested this hypothesis, there is evidence that makes it plausible. For example, several studies have reported that victims experience anger, hostility, and retaliation fantasies after the victimization event (Kilpatrick, Resick, and Veronen, 1981; Riggs et al., 1992; Van Dijk, 2009). Importantly, these feelings may even increase in intensity with time (Orth, Montada, and Maercker, 2006).

There is also evidence that emotions can affect cost-benefit analyses. This evidence mainly comes from experimental studies using hypothetical vignettes in which participants (often students) were presented with an emotion-eliciting event and the possibility to react with an offense (Schweitzer and Gibson, 2008; Shalvi, Van Gelder, and Van der Schalk, 2014; Van Gelder, Elffers, and Reynald, 2014). For example, in one study (Van Gelder et al., 2014), undergraduate students were asked to imagine having to work on an assignment with a fellow student who ended up not doing his share of the work, either due to a legitimate reason or not. When paired up with the same student again for another course, they had the opportunity to retaliate in the same manner in response to the perceived injustice that was done to them before. More specifically, the fellow student needed a good grade to pass the

course this time, whereas the participant did not; thus, the participant had the chance to retaliate by slacking. Higher anger over the cheating by the fellow student turned out to lead to higher intentions to retaliate. Furthermore, in those cases where the fellow student did not have a legitimate reason for slacking, students reported less anticipated shame about retaliating.

In another study, students were presented with a 'bar fight' scenario in which the protagonist assaulted a man who was coming on to his girlfriend (Carmichael and Piquero, 2004). It was found that high levels of anticipated emotional arousal increased the expected thrill of committing an assault and eliminated the deterrent effects of (in)formal sanctions and moral beliefs. In sum, high emotional arousal over perceived unjust treatment can mute the deterrent effect of the future negative consequences of crime, including (in)formal sanctions, moral beliefs, and shame.

Although these experimental studies are informative, they have been unable to test the effects of actual violent victimization on the way cost-benefit analyses are perceived, because, for obvious reasons, such victimization cannot be experimentally manipulated. Additionally, these studies are cross-sectional in nature, which limits the possibility of testing how victimization alters violent decision making at a later point in time. Thus, field studies with a longitudinal character are more suitable to examine how violent victimization influences violent decision making. Furthermore, and importantly, in contrast to the mentioned studies, we hypothesized that violent victimization not only encourages retaliation against the initial wrong-doer, but that it has long-term consequences also towards other individuals. This may work in several ways.

First, prior experiences of victimization are likely to influence the perception of future similar situations, yielding a readiness to perceive further real or imagined threats and corresponding behavioral responses to such situations, which may result in prolonged patterns of hostile responses to provocation (Berkowitz, 1962). Indeed, anger triggered by a specific

victimization event can carry over to infuse normatively unrelated events and decisions and make people indiscriminately punitive (Goldberg, Lerner, and Tetlock, 1999; Lerner and Tiedens, 2006). Furthermore, victimization can trigger a desire to restore one's damaged self-image and gain back a sense of agency and control (Averdijk, 2010). Using violence against others can be a way to exert such agency and control regardless of whether they have anything to do with the initial victimization. Similarly, using violence can be attractive for victims due to its potential to restore their peer status (Anderson, 1999; Berg et al., 2012), as victimization is associated with reduced subsequent peer acceptance and a lower number of friends (Ladd, Kochenderfer, and Coleman, 1997; Ladd and Troop-Gordon, 2003).

## THE PRESENT STUDY

In sum, standard decision making perspectives, such as the rational choice perspective, pay attention to the actual choice process but fall short in explaining criminal motivation and why people's perception of potential conflict situations changes as a consequence of being victimized. Yet, the ability to provide such an explanation is highly pertinent to the victim-offender overlap and address the question why violence begets violence. GST, in contrast, seems better positioned to address these issues as it explains how negative emotional states such as anger may reduce people's ability to engage in legal coping, render people less concerned about the costs of crime and increases their disposition for crime by creating a "desire for revenge" (Agnew, 2006). However, due to data constraints, so far the studies that have alluded to the role of emotions using a GST perspective to examine the victim-offender overlap (e.g., Manasse and Ganem, 2009; Turanovic and Pratt, 2013) have operationalized emotions as relatively enduring and stable traits, instead of feelings experienced at the moment of decision making, i.e., 'states'. In the present study, we aimed to overcome these limitations by drawing from a decision making perspective that accommodates for the role of rational considerations as well as emotional experiences.

We hypothesized that victimization influences the appraisal and reward parameters, such as the costs and benefits, of acting violently in subsequent situations in such a way that victims become more attuned towards the benefits of violence perpetration than towards its costs. Fundamental in our perspective was the idea that the victimization experience influences the interpretation and evaluation of *future* violent situations. Thus, the relations between victimization and violent decision making were expected to extend beyond the immediate situational context in which a victim retaliates directly in the face of perceived wrong-doing. Instead, we predicted that the effects of prior victimization extend far beyond the emotion-eliciting event.

We tested these assumptions using a longitudinal sample of youths from Switzerland in combination with scenario data featuring violent decision making situations. In order to control for a latent disposition towards crime, we included a range of covariates, such as prior criminal involvement (prior violent offending, victimization, and violent decision making), self-control, parenting, anxiety and depression, and lifestyle variables. Thus, we tested whether changes in violent decision making and offending were due to victimization itself instead of to a latent propensity for victimization.

## METHOD

### PARTICIPANTS

Data were collected through a combined longitudinal and intervention study, the Zurich Project on the Social Development of Children and Youths (*z-proso*), a 10-year, multi-wave panel study of youth in the city of Zurich, Switzerland. The study follows a cohort of children who entered primary school in 2004 at an average age of 7 years (Eisner, Malti, and Ribeaud, 2011). The target population consisted of all 2,520 children who entered the first grade in one of the 90 public primary schools in the city. A cluster randomized sampling

approach was used, with schools as the randomization units. The schools were classified by enrollment size and socioeconomic background of the school district. Subsequently, a stratified sample of 56 schools was drawn. The final sample consisted of all 1,675 first graders in these schools.

Data for the present study were drawn from the three most recent waves (four, five, and six), which will henceforth be referred to as T1, T2, and T3, as the measures of interest were collected at these particular time-points and are not available for earlier waves. At T1, 69% of the original target sample participated and the children's mean age was 11.3 years (*SD* = 0.37). At T2, when the children's mean age was 13.7 years (*SD* = 0.37), 82% of the children from the original target sample participated.[2] At T3, when the average age was 15.4 years (*SD* = 0.36), 86% of the children from the original target sample participated. We included only those youths who participated in all three waves in the analysis (*N* = 1,013). Questionnaires were completed in a classroom-setting after school.

## MEASURES

*Violent offending.* Violent offending was measured through six self-reported items at T3 asking respondents about violence perpetration in the preceding twelve months. The items regarded threat/extortion, robbery, serious assault with injury, sexual assault, simple assault, and sexual harassment (see descriptions of these and the other variables in Appendix A). The items were measured with different answering scales: Four of the items were originally coded as count variables (extortion, robbery, serious assault with injury, and sexual assault), whereas the other two (simple assault and sexual harassment) were part of a peer aggression questionnaire derived from Olweus (1993) using a scale from 1 ('never') to 6 ('(almost) every

[2] The participation rate was higher at T2 and T3 than at T1 because active parental consent was not required in the later waves.

day'). Since the latter items could not be meaningfully transformed into a count scale and since removal of these items from the current analysis would have meant the exclusion of the most prevalent types of violence, we adhered to good practice in prior studies (e.g., Osgood and Schreck, 2007; Schreck, Stewart, and Osgood, 2008) and recoded all items to a dichotomy of 0 ('did not commit violence') and 1 ('did commit violence'). These were subsequently summed to represent a variety score (Bendixen, Endresen, and Olweus, 2003). Variety scales have been termed 'the preferred criminal offending scale' because they display high reliability and validity, are less skewed than frequency measures, and are not compromised by high-frequency crime-types of low seriousness (Sweeten, 2012). The prevalence of each of the violent offending items at T3 was 0.2% for sexual assault, 2% for threat/extortion, 2% for robbery, 10% for serious assault, 26% for simple assault, and 6% for sexual harassment.

*Violent victimization.* Victimization was measured at T2 through a self-report questionnaire that asked respondents about six types of violent victimization in the preceding twelve months. Due to the particular instruments used, the types of victimization were very similar, though not exactly identical, to the offending items.[3] The items included robbery, serious assault with a weapon, serious assault without a weapon but with injury, sexual assault, simple assault, and sexual harassment. Similar to the measurement of offending, four of the items were originally measured on a count scale (robbery, assault with weapon, assault without a weapon, and sexual assault), whereas the other two (simple assault and sexual harassment) were part of a peer victimization questionnaire that used a scale from 1 ('never')

[3] As all victimization questions were asked in the context of violence among youths, they may be expected to mainly tap into victimization by other youths, which was not the case for the offending items. However, an analysis of a follow-up question to the offending item on serious assault with injury revealed that 91% of the assaults were committed against persons between 10 and 18 years of age, suggesting that these incidents too primarily occurred between youths.

to 6 (‘(almost) every day’). As for the violent offending scale, all items were recoded into a dichotomy of 0 (‘did not experience violence’) and 1 (‘experienced violence’) and summed into a variety score. The prevalence of each type of victimization at T2 was 8% for robbery, 7% for serious assault with weapon, 10% for serious assault without weapon, 1% for sexual assault, 26% for simple assault, and 19% for sexual harassment.

*Decision making characteristics.* To measure the decision making characteristics, three vignettes, adapted from Huizinga and Esbensen (1990) and Wetzels et al. (2001), containing short descriptions of violent situations were used at T2. Respondents were asked to imagine that they used violence in the described situation and to answer several questions pertaining to it. For male respondents, the other person in the vignette was also male, whereas if the respondent was female, the other person described in the vignette was also female. The vignettes described situations of physical violence, robbery, and verbal violence. The first vignette read:

> "Imagine that another adolescent from your school comes up to you and says: “Get lost, you idiot!” so loudly that others can hear it. Refusing to take it, you punch the other adolescent right in the face. She/he falls on the floor, her/his pants rip, and she/he begins to bleed heavily from her/his nose. You yourself are unharmed. Other people are not involved.”
>
> The second vignette read:
>
> “Imagine that someone from your school has a cool cell phone that you want. After school you wait until the other girl/boy is alone. You stand in front of her/him and threateningly say: “Give me the cell phone, or I’ll beat you up!””
>
> The third vignette read:
>
> “Imagine you are with a few friends at the school playground. A girl/boy you really don’t like walks past you. You say to her/him: “Hey you, do you

have a problem? Get lost, otherwise there will be trouble!" so loudly that others can hear you."

Each vignette was followed by a series of items measuring different aspects of decision making. We averaged responses across the three vignettes to reduce the influence of individual characteristics, experiences, feelings, and cognitions regarding particular scenarios. Aggregating measures in this way reduces error variance and ensures a more valid and reliable estimate of the typical response to a potentially violent situation compared to single scenarios (Van Gelder and De Vries, 2012). We included the following measures.

The first two items, henceforth named "positive feelings" and "perceived seriousness", addressed respondents' affective appraisal of the situation: "Would you feel good doing this?" *(1 not feel good at all - 4 feel very good; α* = .66*)* and "How bad do you think it would be to do something like this?" *(1 not bad at all - 4 very bad; α* = .62).

The subsequent two questions measured respondents' anticipated shame by inquiring about the extent to which they thought they would feel ashamed of their behavior with their friends and their parents, respectively: "Would you be ashamed with your [best friends/parents] because of this?" *(1 not ashamed at all - 4 very much ashamed; α* = .81 towards friends; *α* = .77 towards parents).

The respondents were also asked whether their friends would admire them and find them cool because of their violent behavior: "Would your best friends admire you and think you were cool because of this?" *(1 not admire at all - 4 admire very much; α* = .77), and about the seriousness of their violent behavior as perceived by their friends: "Would your best friends think it is bad to do this?" *(1 not bad at all - 4 very bad; α* = .74*)*.

Finally, two questions inquired about respondents' perceived risk of retaliation; "How likely is it that the other girl/boy would do something to you in revenge later?" *(1 very unlikely - 4 very likely; α* = .62*)* and "How bad would it be for you if the other girl/boy would do something to you later?" *(1 not bad at all - 4 very bad; α* = .74*)*. These two variables were

combined by multiplication into a perceived risk of retaliation measure (see e.g., Van Gelder and De Vries, 2012).

*Control variables.* We included a series of control variables that have been shown in previous research to be related to both victimization and offending. All control variables were measured at T1. We included available measures for prior *victimization* (at T1, items for simple assault, serious assault with a weapon, serious assault without a weapon, and robbery were available) and *offending* (at T1, items for simple assault and serious assault were available). In addition, *decision making characteristics* identical to the T2 measures described above were also included. However, at T1, only the first two vignettes described above were available (as the third vignette was not yet used in this wave).

*Risky leisure activities* were measured with five items referring to unstructured and unsupervised out-of-home leisure activities with friends (e.g., "hang around and have fun with friends at the train station, shopping mall, or park"; $\alpha$ = .77). Answers could range from 1 ('never') to 6 ('(almost) everyday').

*Substance use* was assessed with three items that measured the consumption of tobacco, alcohol, and marijuana consumption. Answers could range from 1 ('never') to 5 ('daily').

*Masculinity norms* was assessed through three items that measured youths' endorsement of violence as a means to defend themselves or those around them (e.g., "A real man must defend himself"; $\alpha$ = .60; derived from Nisbett and Cohen, 1996). The answer categories ranged from 1 "not true at all" to 4 "very true".

*Anxiety and depression* were measured through the Social Behavior Questionnaire (SBQ; Tremblay et al., 1991). The scale included eight items ranging from 1 ('never') to 5 ('very often') (e.g., "I was sad without knowing why"; $\alpha$ = .79).

Our measure for *low self-control* consisted of 10 items measured on a 4-point Likert scale from 1 ('does not apply at all') to 4 ('very much applies') (e.g., "I act spontaneously,

without thinking too much"; $\alpha$ = .75), adapted from Grasmick et al. (1993) (see Ribeaud and Eisner, 2006).

*Dominance* was measured through a teacher-reported single item on a five-point Likert scale (*1 fully untrue - 5 fully true)* ("The child dominates other children").

To control for additional stressful life experiences (Agnew, 2001), we also included youth-reported negative parenting (11 items, $\alpha$ = .65), harsh or erratic parental discipline (6 items, $\alpha$ = .63), and negative secondary school experiences (9 items; $\alpha$ = .80), as well as teacher-reported grades (2 items; $\alpha$ = .83). Finally, we controlled for *sex* ("0" is female, "1" is male), *ethnicity* (with "0" signifying at least one Swiss parent and "1" two non-Swiss parents), and *socio-economic status* (SES). The latter was based on the caregiver's current profession and transformed into an International Socio-Economic Index of Occupational Status (ISEI) score (Ganzeboom et al., 1992). The final SES score was based on the highest ISEI score of the two caregivers.

## ANALYTIC STRATEGY

Our path model is displayed in Figure 1. In accordance with the Cambridge Quality Checklists (Murray, Farrington, and Eisner, 2009), the control variables were measured at T1 to avoid the possibility that they might act as mediating mechanisms. However, by way of robustness checks, we also report additional analyses that used the covariates measured at T2 to investigate the possibility of concurrent spurious effects. Our measure for victimization regarded the period leading up to the T2 interview. Although decision making was also assessed at T2, it was a point measure, measured at the time of the interview. Thus, the time ordering of victimization and decision making was unambiguous as the data on decision making characteristics were collected following those for victimization (see also Menard and Elliott, 1994). Finally, offending was measured for a continuous time span before the T3 interview, again rendering the time order relative to decision making unambiguous.

-- Table 1 about here--

We tested our hypothesized model using path analysis in Mplus (Muthén and Muthén, 1998-2010). Probability plots indicated some deviations from the assumption of multivariate normality; we therefore fitted the models using maximum likelihood estimates robust to non-normality. Furthermore, standard errors were corrected for clustering within classes to control bias. Given that offending was a count variable, we modelled this outcome using a negative binomial model (Hilbe, 2011). Mplus does not provide absolute fit statistics for our model. To obtain a general idea of model fit, we therefore estimated a linear regression model using maximum likelihood without robust standard errors in Stata. The results for this model were similar to those reported below and the fit statistics were excellent: standardized root mean square residual (SRMR) = .02; Tucker Lewis index (TLI) = .98; comparative fit index (CFI) = .99; root mean square error of approximation (RMSEA) = .02 (Hu and Bentler, 1999).

*Missing data*. As in any longitudinal study, missing data arose due to attrition and item-level non-response. At the bivariate level, children who participated in all three waves included in the current analysis were less likely to be rated as aggressive by their teachers at the start of the study (i.e., at age 7) ($OR = 0.712$, $p < .01$), but were no more or less likely to be victimized by their peers at age 8 ($OR = 0.970$, $p > .05$) [4] than children who had not participated in the three most recent waves. For those children who participated in all waves, 321 of all 33,108 data-points (0.96%) were missing. The missing values were not distributed randomly; Little's MCAR test was significant, $\chi^2 (921) = 1070.36$, $p < 0.01$. We therefore used multiple imputation carried out through Bayesian estimation to estimate these missing values for the path analyses (Enders, 2010); the number of imputations was 40 and the overall estimates were computed using the Rubin formula (Rubin, 1987). After imputation, the final sample size for the path model was $N = 1{,}013$.

[4] Peer victimization was not measured at age 7.

# RESULTS

## DESCRIPTIVE STATISTICS

The data revealed that 45% of respondents experienced at least one type of violent victimization between the ages of 12 and 13, i.e., in the year leading up to T2. A substantial minority (16%) reported having experienced multiple types of victimization. At T3, 31% of the respondents reported having committed one type of violent offending, and 10% reported having committed multiple types of violent offending.

In line with expectations, we found substantial correlations between victimization, the decision making characteristics, and offending (Table 1). Victimization was positively related to positive perceptions of violent action, including feeling good about violent behavior and being admired by friends. In addition, victimization was negatively related to negative perceptions of violent action, including the perceived seriousness of violent behavior, feeling ashamed with parents and friends, perceived seriousness by friends, and the perceived risk of retaliation.

Likewise, offending was related to the decision-making characteristics. Specifically and as expected, offending was positively related to feeling good about violent behavior and to perceived admiration by friends, and negatively to the perceived seriousness of violent behavior, feelings of shame with parents or friends, perceived seriousness by friends, and a high perceived risk of relation. Offending was also positively related to victimization.

-- Table 1 about here--

## VICTIMIZATION, DECISION MAKING, AND OFFENDING

To test our hypotheses, we estimated a longitudinal path model without the mediator variables (i.e., the decision making characteristics) and another including them. The results

for both models are displayed in Table 2. Model 1 displays the direct effect of victimization on offending without the mediator variables but including all control variables. It shows that prior victimization was highly significantly related to later offending.

In Model 2, the decision-making characteristics were added. The results show that victimization in the past year affected almost all decision-making characteristics in the expected direction. Specifically, victimization was associated with increased positive emotions about using violence and a higher perceived admiration by friends. Furthermore, it was associated with a lower seriousness of acting violently as perceived both by the youths themselves and by their friends, and less anticipated shame. The only variable not associated with victimization at the $p < .05$ level was the perceived risk of retaliation. Note that these results were controlled for these same variables measured at T1 and a range of other potentially confounding variables (see Table 2).

Table 2 also displays the estimated effects of the decision making variables on later offending. The results indicate that positive feelings about using violence led to a higher likelihood of offending. Similarly, higher shame with one's parents about the violent behavior was related to a lower likelihood of offending, as was a higher perceived risk of retaliation.

After inclusion of these mediator variables, the direct effect of victimization on offending was reduced by 1-(.088/.141)=38%. Further tests of the mediating mechanisms responsible for this reduction, reported under "Indirect effects" in Table 2, revealed that this was primarily due to the effect of positive feelings. The mediating mechanisms through shame with parents was significant at the $p < .10$ level only.

—Table 2 about here—

In a next step, we combined the first six decision making items into one summative scale for this study as the correlations in Table 1 indicate that they work well in combination.[5]

[5] To this end, the variables "perceived seriousness", "perceived seriousness by friends", "shame with friends", and "shame with parents" were reverse coded. We subsequently computed the mean across all six items.

The advantage of this combined scale compared to the single items is that a multiple item scale reduces collinearity and yields greater reliability. An exploratory factor analysis showed that inclusion of these items into a summative scale was appropriate (Eigenvalue > 3.1; factor loadings > |0.62|; one component extracted).[6] The results of the hypothesized path model using this scale, which we termed "Expected Benefits", are reported in Table 3. Model 1 shows that victimization was related to later offending when controlling for all covariates except the mediator variables. Model 2 displays the findings with the mediator variables included. The estimated coefficients for the control variables for Model 2 are displayed in Table B.1 in Appendix B. Victimization increased the expected benefits of violent action, which, in turn, increased the likelihood of subsequent offending. Victimization was also associated with (a decreased) risk of retaliation (marginally significant), which, in turn, resulted in an increased likelihood of offending. As reported in the lower part of the table under "Indirect effects", the mediation effect of victimization on offending through expected benefits was statistically significant. In total, inclusion of the mediator variables reduced the effect of victimization on offending by 1-(.103/.139)=26%.

## ROBUSTNESS CHECKS

In sum, the results so far show that the association between victimization and later offending is mediated by a changed appraisal of perceived costs and benefits in violent situations. To ensure the robustness of our results, we performed a series of additional analyses, three for the full battery of individual decision making items and three for the overall expected benefits measure, the results of which are reported in Tables 4 and 5.

[6] The factor analysis was performed by vignette, because a factor analysis of all items across the three vignettes revealed substantial within-vignette correlation.

First, we estimated a path model for an incidence measure of delinquency, which is a count of the total number of committed offenses.[7] The results are shown in the two columns under "1. Offense incidence" in Table 4 for the individual decision-making items and in Table 5 for the overall expected benefits measure. The results on the main and mediation effects are, although somewhat weaker for some of the effects, similar to those reported in Tables 2 and 3, with one exception: the indirect effect through positive feelings was significant at the $p <$ .10 level only, whereas the indirect effect through shame with parents reached statistical significance at the $p < .05$ level (Table 4).

Second, we estimated a model using an incidence measure of victimization (reported under "2. Victimization incidence" in Tables 4 and 5).[8] The results for both the individual decision-making items and the overall benefits scale were similar to those reported in Tables 2 and 3: i.e., the effect of victimization on later offending was mediated through positive feelings in Table 4 and through expected benefits in Table 5.

Third, we estimated models that included control variables from the same wave as the mediators (i.e., at T2; reported under "3. T2 covariates" in Tables 4 and 5). Although several of the main effects remained significant and the direction of the effects was identical, the overall support for our hypotheses was weaker as there was only marginal evidence for the indirect effects (i.e., the expected benefits measure was marginally significant at the $p < .10$ level, see Table 5). Although including the T2 covariates may control for concurrent spurious effects, control variables measured in the same wave as the predictors might also act as mediators (Murray, Farrington and Eisner, 2009). Although it is difficult to disentangle which of these two possibilities explains the results, the fact that not even victimization was significantly related to offending when the T2 covariates were added (see Model 1 in Tables 4 and 5) seems to suggest support for the latter explanation, as it is contrary to the majority of

[7] Please refer to Appendix A in the online supplement for the coding of the offending incidence variable.
[8] Please refer to Appendix A in the online supplement for the coding of the victimization incidence variable.

previous criminological research on the victim-offender overlap as well as our results from all other analyses presented in Tables 2 through 5. However, alternative explanations cannot be excluded. Nonetheless, given that including covariates from the same wave as the predictors may imply that the covariates also act as mediators, the fact that we still find a marginally significant mediation effect for the overall scale in Table 5 in our view lends credibility to the robustness of the results.

## DISCUSSION

As was mentioned at the outset of this article, there is no dearth of evidence demonstrating a strong association between violent offending and victimization. The current challenge is to find theoretical explanations for why this is the case. This article combined a choice perspective with appraisal theory to provide an account of the causal mechanisms underlying the victim-offender overlap. We hypothesized that being victimized influences people's experience and appraisal of subsequent interpersonal conflict situations, which, in turn, influences the likelihood that they will engage in violent offending themselves in these future situations. As predicted, we found relations between victimization and decision making characteristics, which, in turn, influenced the probability of subsequent offending. In other words, our mediation hypothesis was empirically supported. More specifically, the results showed that prior victimization increases the likelihood that individuals anticipate positive feeling about violent offending while reducing feelings of anticipated shame. Youths in our study also reported a lower perceived seriousness of violent offending after they had been victimized themselves. Furthermore, youths anticipated to be admired more by friends in case they would engage in offending after they had been victimized, and also anticipated that their friends would think less negatively of their violent behavior. In short, as expected, victimization affects the appraisal of subsequent potentially conflictive decision making situations. Altogether, these findings provide strong evidence that a victimization event

changes youths' views towards the costs and benefits of offending and offer a compelling new theoretical explanation of the victim-offender overlap.

As was also expected, the altered appraisal of violent situations that resulted from the victimization experience in turn predicted involvement in violence. Specifically, feeling good about violence increased the likelihood of engaging in violent offending, while feelings of shame with one's parents and a higher perceived risk of retaliation were related to a lower likelihood of violent offending.

Notably, the effect of victimization on later offending was partially mediated by an altered appraisal of violent situations. The main driving mechanism for this effect turned out to be the anticipated positive feelings when using violence. This finding can readily be understood from a GST perspective as well as an appraisal perspective. Recall that both perspectives argue that negative emotional states such as anger may increase people's disposition for crime or violence by creating a "desire for revenge" (Agnew, 2006). In our case, the use of violence is the revenge for earlier wrongdoing, i.e., having been victimized, and a satisfactory way of mitigating, or coping with, the negative consequences of the victimization event, such as a suffered loss of self-esteem or status. Intense emotional states such as intense anger are known to have strong motivational drive properties (e.g., Loewenstein, 1996; Zimring and Hawkins, 1973). In plain terms, quenching one's thirst for revenge feels good, perhaps so good that it can crowd out other considerations that normally guide our actions altogether.

Importantly, the effects were controlled for a large set of variables; prior involvement in crime and victimization experiences, prior decision making, and a range of supplementary variables that have been associated with the victim-offender overlap in earlier studies, such as self-control and risky leisure activities, which lends confidence and credibility to the results. By controlling for these variables, we showed that the link between victimization and

offending is not simply spurious as some have suggested (e.g., Gottfredson and Hirschi, 1990).

Our findings have several theoretical implications. First and foremost, they confirm our assumption that choice perspectives provide important input for research on the victim-offender overlap and that a decision making perspective is not to be ignored in future research. Second, the findings also have implications for traditional criminal choice theories, e.g., rational choice theory, which typically view crime as situational. As the present study shows, and in line with some of the assumption of GST (Agnew, 2006, 2013), this is only part of the story as the results indicate that the seeds of violent behavior are sown during earlier violent encounters that may have taken place years earlier. In other words, decision making is not only influenced by situational variables, but also by prior experiences.

Having said that, our study was prone to several limitations, which may be addressed in future research efforts. Perhaps the most important limitation was the omission of variables that measure emotions, notably feelings of state anger, as a consequence of the victimization event. This means that our assumption that these play an important role in changing people's appraisals in subsequent situations is implied rather than directly measured in our design. Nonetheless, given earlier research that established an association between victimization and anger (e.g., Kilpatrick, Resick, and Veronen, 1981; Orth, Montada, and Maercker, 2006; Riggs et al., 1992), there is little reason to doubt this association in the present context. Second, our data did not assess seriousness of victimization. It is possible that more serious victimization incidents alter cost-benefit analyses more dramatically than less serious incidents and hence have larger effects or a different direction. As was mentioned in the introduction, appraisal theory predicts that fearful individuals perceive a situation as riskier than angry individuals which may inhibit rather than facilitate violent action. This hypothesis should be investigated in future research in order to shed more light on the mechanisms involved. Third, although our hypotheses were not limited to youths, our data were, and thus

replication of our findings among adult samples is recommended to see whether the results hold and whether the underlying mechanisms are similar. Finally, we did not consider how decision making and behavioral responses to victimization are embedded in structural constraints, including the economic, familial, educational, and legal institutional orders (Hindelang, Gottfredson, and Garofalo, 1978). Future work investigating such moderating factors is encouraged.

Having said that, the present study also had several strengths that are worth mentioning. For one thing, we used longitudinal data across three waves, which enabled us to draw firm conclusions regarding the temporal ordering between the predictors and outcomes. This design also allowed us to control for a range of control variables measured prior to the central predictor, i.e., victimization (Murray, Farrington, and Eisner, 2009). Furthermore, other than is commonly the case with criminological decision making studies, our dependent variable (i.e., offending) regarded actual behavior rather than behavioral intention.

We started this paper by citing the extensive review by Lauritsen and Laub (2007) on the victim-offender overlap. These authors argued that a decision making focus could provide an important way forward in the theoretical debate. We believe that our findings confirm their intuition, as they underline the importance of considering choice and appraisal perspectives in addition to the variables commonly encountered in studies on the victim-offender overlap, and that this conclusion can be used as a basis for the further elaboration of the causal mechanisms involved.

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Table 1. Correlations between Victimization, Costs and Benefits, and Offending ($N$ = 1,013)

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | *M* | *SD* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. T2 Victimization | --- | --- | --- | --- | --- | --- | --- | --- | --- | .71 | .96 |
| 2. T2 Positive feelings | .21** | --- | --- | --- | --- | --- | --- | --- | --- | .67 | .56 |
| 3. T2 Perceived seriousness | -.20** | -.70** | --- | --- | --- | --- | --- | --- | --- | 2.09 | .62 |
| 4. T2 Admiration by friends | .17** | .53** | -.47** | --- | --- | --- | --- | --- | --- | .88 | .68 |
| 5. T2 Perceived seriousness by friends | -.15** | -.55** | .63** | -.63** | --- | --- | --- | --- | --- | 1.63 | .73 |
| 6. T2 Shame with friends | -.15** | -.57** | .62** | -.56** | .78** | --- | --- | --- | --- | 1.44 | .86 |
| 7. T2 Shame with parents | -.15** | -.48** | .54** | -.35** | .53** | .65** | --- | --- | --- | 1.99 | .79 |
| 8. T2 Risk of retaliation | -.09** | -.33** | .45** | -.24** | .41** | .41** | .35** | --- | --- | 3.15 | 2.03 |
| 9. T3 Offending | .19** | -.30** | -.31** | .26** | -.26** | -.26** | -.25** | -.21** | --- | .45 | .78 |
| Control Variables | | | | | | | | | | | |
| T1 Victimization | .27** | .08* | -.08** | .07* | -.11** | -.07* | -.08* | -.06* | .19** | .87 | 1.06 |
| T1 Offending | .17** | .21** | -.20** | .14** | -.19** | -.19** | -.16** | -.08* | .25** | .46 | .64 |
| T1 Positive feelings | .07* | .24** | -.24** | .20** | -.27** | -.27** | -.21** | -.16** | .17** | .29 | .46 |
| T1 Perceived seriousness | -.06† | -.25** | .26** | -.19** | .28** | .28** | .22** | .16** | -.20** | 2.54 | .59 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 Admiration by friends | .08* | .27** | -.27** | .32** | -.30** | -.29** | -.20** | -.16** | .22** | .64 | .69 |
| T1 Perceived seriousness by friends | -.07* | -.26** | .31** | -.26** | .36** | .32** | .26** | .25** | -.20** | 2.01 | .75 |
| T1 Shame with friends | -.06* | -.28** | .32** | -.29** | .36** | .41** | .32** | .24** | -.21** | 1.75 | .93 |
| T1 Shame with parents | -.04 | -.17** | .24** | -.18** | .27** | .31** | .32** | .16** | -.16** | 2.23 | .83 |
| T1 Risk of retaliation | .00 | -.15** | .19** | -.11** | .17** | .20** | .17** | .32** | -.13** | 3.59 | 2.36 |
| T1 Risky leisure activities | .12** | .18** | -.19** | .19** | -.20** | -.22** | -.15** | -.18** | .15** | 1.13 | .98 |
| T1 Substance use | .10** | .20** | -.22** | .14** | -.14** | -.14** | -.14** | -.10** | .22** | 1.04 | .17 |
| T1 Masculinity norms | .06† | .21** | -.20** | .22** | -.23** | -.24** | -.19** | -.10** | .20** | 2.17 | .68 |
| T1 Anxiety and depression | .14** | -.03 | .04 | -.07* | .09** | .13** | .06† | .05 | .01 | 2.05 | .66 |
| T1 Low self-control | .17** | .24** | -.22** | .18** | -.24** | -.21** | -.18** | -.19** | .22** | 1.95 | .47 |
| T1 Dominance | .06† | .07* | -.13** | .06† | -.09** | -.08* | -.03 | -.03 | .10** | 1.49 | .89 |
| T1 Negative parenting | .14** | .10** | -.13** | .15** | -.19** | -.17** | -.15** | -.08* | .11** | 1.78 | .38 |
| T1 Harsh or erratic parental discipline | .14** | .11** | -.10** | .10** | -.15** | -.10** | -.07* | -.03 | .15** | 1.51 | .42 |
| T1 Negative secondary school experiences | -.18** | -.21** | .22** | -.13** | .20** | .17** | .12** | .12** | -.17** | 3.26 | .48 |
| T1 Grades | -.06† | -.02 | -.07* | -.12** | .07* | .14** | .09** | .03 | -.11** | 3.30 | 1.17 |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sex | .11** | .25** | -.28** | .30** | -.38** | -.36** | -.19** | -.13** | .26** | .51 | .50 |
| Non-Swiss background | .00 | .05 | -.04 | .10** | -.02 | -.09** | .02 | .01 | .03 | .45 | .50 |
| T1 Socio-economic status | -.06† | -.03 | .09** | -.13** | .06† | .16** | .06† | .01 | -.07* | 47.72 | 19.73 |

† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$ (two-tailed).

Table 2. Path Analysis Results of Offending on Victimization and Decision Making Characteristics ($N$ = 1,013)

| Effects | Model 1 | | | | Model 2 | | | |
|---|---|---|---|---|---|---|---|---|
| | B | | (S.E.) | STD | B | | (S.E.) | STD |
| Effect of Victimization on Offending | | | | | | | | |
| T2 Victimization -> T3 Offending | .141 | ** | (.053) | .213 | .088 | | (.055) | .121 |
| Effect of Victimization on Decision Making | | | | | | | | |
| T2 Victimization -> T2 Positive feelings | --- | | --- | --- | .092 | ** | (.018) | .159 |
| T2 Victimization -> T2 Perceived seriousness | --- | | --- | --- | -.087 | ** | (.019) | -.136 |
| T2 Victimization -> T2 Admiration by friends | --- | | --- | --- | .084 | ** | (.023) | .119 |
| T2 Victimization -> T2 Perceived seriousness by friends | --- | | --- | --- | -.060 | ** | (.023) | -.078 |
| T2 Victimization -> T2 Shame with friends | --- | | --- | --- | -.074 | ** | (.027) | -.082 |
| T2 Victimization -> T2 Shame with parents | --- | | --- | --- | -.082 | ** | (.028) | -.101 |
| T2 Victimization -> T2 Risk of retaliation | --- | | --- | --- | -.188 | † | (.104) | -.057 |
| Effect of Decision Making on Offending | | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| T2 Positive feelings -> T3 Offending | --- | --- | --- | .226 | * | (.109) | .180 |
| T2 Perceived seriousness -> T3 Offending | --- | --- | --- | -.093 | | (.115) | -.082 |
| T2 Admiration by friends -> T3 Offending | --- | --- | --- | .185 | † | (.105) | .179 |
| T2 Perceived seriousness by friends -> T3 Offending | --- | --- | --- | .080 | | (.134) | .083 |
| T2 Shame with friends -> T3 Offending | --- | --- | --- | .095 | | (.121) | .117 |
| T2 Shame with parents -> T3 Offending | --- | --- | --- | -.175 | * | (.080) | -.197 |
| T2 Risk of retaliation -> T3 Offending | --- | --- | --- | -.057 | ** | (.021) | -.257 |
| | | | | | | | |
| Indirect Effects | --- | --- | --- | | | | |
| T2 Victimization -> T2 Positive feelings -> T3 Offending | --- | --- | --- | .021 | * | (.010) | n.a. |
| T2 Victimization -> T2 Perceived seriousness -> T3 Offending | --- | --- | --- | .008 | | (.010) | n.a. |
| T2 Victimization -> T2 Admiration by friends -> T3 Offending | --- | --- | --- | .016 | | (.010) | n.a. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| T2 Victimization -> T2 Perceived seriousness by friends -> T3 Offending | --- | --- | --- | -.005 | | (.009) | n.a. |
| T2 Victimization -> T2 Shame with friends -> T3 Offending | --- | --- | --- | -.007 | | (.009) | n.a. |
| T2 Victimization -> T2 Shame with parents -> T3 Offending | --- | --- | --- | .014 | † | (.008) | n.a. |
| T2 Victimization -> T2 Risk of retaliation -> T3 Offending | --- | --- | --- | .011 | | (.008) | n.a. |

*NOTES*: Estimates from Model 1 and Model 2 were controlled for prior victimization, prior offending, prior decision making characteristics, risky leisure activities, substance use, masculinity norms, anxiety and depression, low self-control, dominance, negative parenting, harsh or erratic parental discipline, negative secondary school experiences, grades, sex, non-Swiss ethnicity, and SES. The estimated coefficients for the control variables are not displayed for reasons of parsimony.

*ABBREVIATIONS*: B = Unstandardized Coefficients. S.E. = Standard Error. STD = Standardized Coefficients.

† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$ (two-tailed).

Table 3. Path Analysis Results of Offending on Victimization and Expected Benefits ($N$ = 1,013)

| Effects | Model 1 | | | | Model 2 | | | |
|---|---|---|---|---|---|---|---|---|
| | B | | (S.E.) | STD | B | | (S.E.) | STD |
| Effect of Victimization on Offending | | | | | | | | |
| T2 Victimization -> T3 Offending | .139 | ** | (.052) | .208 | .103 | * | (.052) | .142 |
| Effect of Victimization on Decision Making | | | | | | | | |
| T2 Victimization -> T2 Expected benefits | --- | | --- | --- | .081 | ** | (.018) | .137 |
| T2 Victimization -> T2 Risk retaliation | --- | | --- | --- | -.190 | † | (.104) | -.058 |
| Effect of Decision Making on Offending | --- | | --- | --- | | | | |
| T2 Expected benefits -> T3 Offending | --- | | --- | --- | .437 | ** | (.110) | .353 |
| T2 Risk retaliation -> T3 Offending | --- | | --- | --- | -.055 | ** | (.020) | -.245 |
| Indirect Effects | --- | | --- | --- | | | | |
| T2 Victimization -> T2 Expected benefits -> T3 Offending | --- | | --- | --- | .035 | ** | (.012) | n.a. |

| | | | | | | |
|---|---|---|---|---|---|---|
| T2 Victimization -> T2 Retaliation risk -> T3 Offending | --- | --- | --- | .010 | (.007) | n.a. |

*NOTES*: Estimates from Model 1 and Model 2 were controlled for prior victimization, prior offending, prior decision making characteristics, risky leisure activities, substance use, masculinity norms, anxiety and depression, low self-control, dominance, negative parenting, harsh or erratic parental discipline, negative secondary school experiences, grades, sex, non-Swiss ethnicity, and SES. The estimated coefficients for the control variables are not displayed for reasons of parsimony; the estimated coefficients for the control variables for Model 2 are displayed in Table B.1 in Appendix B.

*ABBREVIATIONS*: B = Unstandardized Coefficients. S.E. = Standard Error. STD = Standardized Coefficients.

† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$ (two-tailed).

Table 4. Robustness Checks of Path Analyses of Offending on Victimization and Decision Making Characteristics ($N$ = 1,013)

| Effects | 1. Offense incidence | | | | 2. Victimization incidence | | | | 3. T2 covariates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Model 1 | | Model 2 | | Model 1 | | Model 2 | | Model 1 | | Model 2 | |
| | B | (S.E.) | B | (S.E.) | B | (S.E.) | B | (S.E.) | B | (S.E.) | B | (S.E.) |
| Effect of Victimization on Offending | | | | | | | | | | | | |
| T2 Victimization -> T3 Offending | .235 ** | (.083) | .151 † | (.079) | .033 * | (.014) | .019 | (.015) | .042 | .049 | .037 | (.048) |
| Effect of Victimization on Decision Making | | | | | | | | | | | | |
| T2 Victimization -> T2 Positive feelings | --- | --- | .093 ** | (.017) | --- | --- | .024 ** | (.005) | --- | --- | .033 * | (.017) |
| T2 Victimization -> T2 Perceived | --- | --- | -.088 ** | (.019) | --- | --- | -.021 ** | (.006) | --- | --- | -.035 * | (.016) |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| seriousness | | | | | | | | | | | | | | | | |
| T2 Victimization -> T2 Admiration by friends | --- | --- | .083 | ** | (.023) | --- | --- | .015 | * | (.006) | --- | --- | .050 | † | (.027) | |
| T2 Victimization -> T2 Perceived seriousness by friends | --- | --- | -.060 | ** | (.023) | --- | --- | -.007 | | (.006) | --- | --- | -.035 | † | (.020) | |
| T2 Victimization -> T2 Shame with friends | --- | --- | -.074 | ** | (.027) | --- | --- | -.013 | † | (.007) | --- | --- | -.051 | * | (.024) | |
| T2 Victimization -> T2 Shame with parents | --- | --- | -.083 | ** | (.028) | --- | --- | -.015 | * | (.006) | --- | --- | -.048 | † | (.026) | |
| T2 Victimization -> T2 Risk of retaliation | --- | --- | -.187 | † | (.104) | --- | --- | -.034 | | (.025) | --- | --- | -.120 | | (.094) | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Effect of Decision Making on Offending | | | | | | | | | | | | | |
| T2 Positive feelings -> T3 Offending | --- | --- | .243 | † | (.130) | --- | --- | .223 | * | (.108) | --- | --- | .068 | (.119) |
| T2 Perceived seriousness -> T3 Offending | --- | --- | -.157 | | (.178) | --- | --- | -.099 | | (.114) | --- | --- | -.016 | (.130) |
| T2 Admiration by friends -> T3 Offending | --- | --- | .248 | † | (.145) | --- | --- | .186 | † | (.106) | --- | --- | .098 | (.103) |
| T2 Perceived seriousness by friends -> T3 Offending | --- | --- | -.171 | | (.208) | --- | --- | .075 | | (.132) | --- | --- | .087 | (.140) |
| T2 Shame with | --- | --- | .228 | | (.176) | --- | --- | .091 | | (.122) | --- | --- | -.023 | (.116) |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| friends -> T3 Offending | | | | | | | | | | | | | | | |
| T2 Shame with parents -> T3 Offending | --- | --- | -.342 | ** | (.113) | --- | --- | -.170 | * | (.081) | --- | --- | -.165 | * | (.076) |
| T2 Risk of retaliation -> T3 Offending | --- | --- | -.007 | | (.034) | --- | --- | -.056 | ** | (.021) | --- | --- | -.046 | * | (.020) |
| Indirect Effects | | | | | | | | | | | | | | | |
| T2 Victimization -> T2 Positive feelings -> T3 Offending | --- | --- | .023 | † | (.012) | --- | --- | .005 | * | (.003) | --- | --- | .002 | | (.004) |
| T2 Victimization -> T2 Perceived seriousness -> T3 Offending | --- | --- | .014 | | (.016) | --- | --- | .002 | | (.002) | --- | --- | .001 | | (.005) |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T2 Victimization -> T2 Admiration by friends -> T3 Offending | --- | --- | .021 | | (.013) | --- | --- | .003 | (.002) | --- | --- | .005 | (.005) |
| T2 Victimization -> T2 Perceived seriousness by friends -> T3 Offending | --- | --- | .010 | | (.013) | --- | --- | -.001 | (.001) | --- | --- | -.003 | (.006) |
| T2 Victimization -> T2 Shame with friends -> T3 Offending | --- | --- | -.017 | | (.015) | --- | --- | -.001 | (.002) | --- | --- | .001 | (.006) |
| T2 Victimization -> T2 Shame with parents -> T3 Offending | --- | --- | .028 | * | (.013) | --- | --- | .003 | (.002) | --- | --- | .008 | (.006) |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T2 Victimization -> T2 Risk of retaliation -> T3 Offending | --- | --- | .001 | (.006) | --- | --- | .002 | (.002) | --- | --- | .006 | (.005) |

*NOTES*. Estimates from Model 1 and Model 2 were controlled for prior victimization, prior offending, prior decision making characteristics, risky leisure activities, substance use, masculinity norms, anxiety and depression, low self-control, dominance, negative parenting, harsh or erratic parental discipline, negative secondary school experiences, grades, sex, non-Swiss ethnicity, and SES. For robustness check 3 (T2 covariates), we added all control variables measured at T2.

*ABBREVIATIONS*: B = Unstandardized Coefficients. S.E. = Standard Error.

† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$ (two-tailed).

Table 5. Robustness Checks of Path Analyses of Offending on Victimization and Overall Expected Benefits Scale ($N$ = 1,013)

| Effects | 1. Offense incidence | | | | 2. Victimization incidence | | | | 3. T2 covariates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Model 1 | | Model 2 | | Model 1 | | Model 2 | | Model 1 | | Model 2 | |
| | B | (S.E.) | B | (S.E.) | B | (S.E.) | B | (S.E.) | B | (S.E.) | B | (S.E.) |
| Effect of Victimization on Offending | | | | | | | | | | | | |
| T2 | .324 ** | (.122) | .242 * | (.124) | .033 * | (.014) | .025 † | (.014) | .051 | (.049) | .040 | (.048) |
| Victimization -> T3 Offending | | | | | | | | | | | | |
| Effect of Victimization on Decision Making | | | | | | | | | | | | |
| T2 | --- | --- | .082 ** | (.018) | --- | --- | .016 ** | (.004) | --- | --- | .043 ** | (.015) |

| | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Victimization -> T2 Expected benefits | | | | | | | | | | | | | | | | |
| T2 | --- | --- | -.189 | † | (.104) | --- | --- | -.034 | | (.025) | --- | --- | -.122 | | (.093) | |
| Victimization -> T2 Risk retaliation | | | | | | | | | | | | | | | | |
| Effect of Decision Making on Offending | | | | | | | | | | | | | | | | |
| T2 | --- | --- | 1.016 | ** | (.191) | --- | --- | .450 | ** | (.114) | --- | --- | .287 | * | (.116) | |
| Expected benefits -> T3 Offending | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T2 Risk retaliation -> T3 Offending | --- | --- | -.019 | | (.031) | --- | --- | -.054 | ** | (.020) | --- | --- | -.044 | * | (.018) |
| Indirect Effects | | | | | | | | | | | | | | | |
| T2 Victimization -> T2 Expected benefits -> T3 Offending | --- | --- | .083 | ** | (.023) | --- | --- | .007 | ** | (.003) | --- | --- | .012 | † | (.007) |
| T2 Victimization -> T2 Retaliation risk -> T3 | --- | --- | .004 | | (.006) | --- | --- | .002 | | (.002) | --- | --- | .005 | | (.004) |

Offending

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*NOTES*: Estimates from Model 1 and Model 2 were controlled for prior victimization, prior offending, prior decision making characteristics, risky leisure activities, substance use, masculinity norms, anxiety and depression, low self-control, dominance, negative parenting, harsh or erratic parental discipline, negative secondary school experiences, grades, sex, non-Swiss ethnicity, and SES. As displaying the estimated coefficients for the control variables would increase the size of the table considerably, they are not displayed for reasons of parsimony.

*ABBREVIATIONS*: B = Unstandardized Coefficients. S.E. = Standard Error.

† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$ (two-tailed).

## Appendix A. Specification of Variables

*Offending*

Offending questionnaire Nearly all adolescents have in the past done things that are not allowed, for example stealing or breaking things. Some adolescents have also in the past beaten up and injured someone on purpose. How about you ***in the past 12 months***, i.e. ***since July 2010***?

**Since July 2010**, have you ever:

- threatened anyone with violence to obtain money or goods? [Extortion]
- taken money or things from anyone while using violence? [Robbery]
- hit, kicked or cut anyone deliberately while injuring him/her? [Serious assault]
- forced a person against their will to perform sexual acts that involved contact with their or your own genitals?

(follow-up question: If yes, **how many times since July 2010?**)

Peer victimization questionnaire How many times since July 2010 have you:

- hit, bit or kicked another youth, or pulled his/her hair? [Simple assault]
- sexually harassed another youth (e.g., hit on you, groped you)? [Sexual harassment]

We used the following procedure to recode the offending items from response categories to frequencies. For the offending items that were recorded in a count format (i.e., serious assault, extortion, robbery, sexual assault), we took the incidence as originally recorded. For the offending items that were recorded on a Likert scale (i.e., simple assault, sexual harassment), we recoded the answering categories to incidences in the following way: “never” was recoded to an incidence of “0”, “1-2 times” to “2”, “3-10 times” to “7”, and “approximately once a

month", "approximately once a week" and "(almost) daily" to "10". Subsequently, all items were summed into a scale. Inspection of the descriptive statistics of the resulting offence incidence variable revealed skew and outlying cases. We therefore capped the final incidence variable at 10 incidents (T1: $M = 1.60$, $SD = 2.82$, T3: $M = 1.50$, $SD = 2.91$ for $N = 1{,}013$).

*Victimization*

The next few questions are about whether you have experienced violence by *other adolescents in the past year*. This could have happened at various locations, for example on the street, at school, or with siblings at home.

Serious victimization questionnaire

In the *past 12 months*, so **since July 2010**, has one of the following things happened to you? And if yes, **how many times** since July 2010?

- Someone took something from you while using violence or threatening with violence, for example your purse, bike or money [Robbery].
- Someone deliberately injured you with a weapon (e.g., a knife) or with an object (e.g., a stick) or through kicking you with heavy shoes [Serious assault with weapon].
- Someone hit you so seriously, that you got injured (e.g., a bleeding wound or a black eye). However, no weapon or object was used [Serious assault without weapon].
- Someone forced you to perform unwanted sexual acts, or to endure unwanted sexual acts, through violence or serious threats. This involved exposed genitals (e.g. rape).

Peer aggression questionnaire

This part is about **bullying**. Adolescents can be very mean to each other sometimes. How about you? In the last year, i.e. **since July 2010**, have you been bullied by other adolescents?

*This could be, for example, on the way to school, when being out, at home, or on the internet.*

How many times **since July 2010** have other youths:

- hit, bit or kicked you or pulled your hair? [Simple assault]
- sexually harassed you (e.g., hit on you, groped you)? [Sexual harassment]

We used the same procedure to recode the victimization items from response categories to frequencies as described for the offending items above (T1: $M = 2.49$, $SD = 3.40$, T2: $M = 2.36$, $SD = 3.45$ for $N = 1{,}013$).

*Risky leisure activities*

What do you do in your free time when you are not at home? How often do you do the following things?

- Meet up with friends *on Friday or Saturday evenings* and do something with them.
- Meet up with friends at a house where there are no adults in the afternoon
- Go to a party or festival with friends, *in the evening,* without the parents.
- Hang around with friends in a park, in the train station, or in a shopping mall, and have fun, *in the afternoon.*
- Hang around with friends in a park, in the train station, or in a shopping mall, and have fun, *in the evening.*

*Substance use*

In the last year, i.e. since January 2008 have you …

- Smoked *cigarettes*?
- Smoked a *joint* (i.e. hashish, marijuana or cannabis)?
- Drunk at least one glass of *alcohol* (e.g. beer, vodka, mixed drinks, wine)?

*Masculinity norms*

- A man is allowed to use violence when he is insulted.
- A real man is ready to use violence when someone says bad things about his family.
- A real man is strong and protects his family.

*Anxiety and depression*

Please indicate how you felt in the past month.

- I cried.
- I was fearful for no particular reason.
- I was unhappy.
- I felt lonely.
- I could not fall asleep at night.
- I was sad without knowing why.
- I was bored.
- I was worried.

*Self-control*

- I act spontaneously, without thinking too much.
- I try to get what I want, even if this causes problems for others.
- I enjoy doing dangerous things, just because it is fun.
- If I don’t get what I want fast, I get angry.
- I enjoy going out and doing something rather than reading and thinking.
- I don’t care if others are upset about something that I did.
- I lose control pretty easily.
- If I can, I like to do something with my hand rather than with my head.

- I always do whichever I like doing in that moment, without considering the consequences.
- Excitement and adventure are more important to me than security.

*Dominance*

- The child dominates other children

*Negative parenting*

Please mark with crosses which of the things below occur *never, rarely*, *sometimes* or *often* in your home.

- Your parents talk to you about your friends or about the other students in your class (reverse coded)
- Your parents let you know when you have done a good job with something (reverse coded)
- Your parents are very strict with you when you don't do exactly as they say
- You play games or do other fun things with your parents (reverse coded)
- Your parents reward you for doing something well (reverse coded)
- Your parents order you around and do not let you talk back to them
- Your parents help you when you struggle with your homework (reverse coded)
- Your mother or father hugs you to comfort you when you are say (reverse coded)
- Your parents show you that they are in charge
- Your parents are interested in what you do (reverse coded)
- When you have a problem you can talk to your parents about it (reverse coded)

*Harsh or inconsistent parental discipline*

When you misbehave or are disobedient, what do your parents do?

Do your parents do the things below *never*, *rarely*, *sometimes* or *often*?

- Your parents yell or scream at you
- Your parents threaten to punish you but subsequently do nothing
- Your parents slap you
- Your parents spank you with their hand
- Your parents punish you more severely than usual when they are in a bad mood
- Your parents pull your hair or ears

*Negative secondary school experiences*

You've been to school for over four years already now. How are you doing there?

Please tell us how true the statements below are *for you*.

- I enjoy going to school
- My teacher treats me fairly
- We have a really good sense of community within the class
- I enjoy doing my homework
- I get on well with my teacher
- I get on well with the other kids in my class
- It think school is useless
- My teacher helps me when necessary
- The other kids in my class are nice to me

*Teacher reported grades*

- Math
- Reading and expressing oneself verbally

**Appendix B. Results for the control variables**

Table B.1. Path Analysis Results of Offending on Victimization and Expected Benefits including Control Variables ($N$ = 1,013)

| Effects | B | |
|---|---|---|
| Effect of Victimization on Offending | | |
| T2 Victimization -> T3 Offending | .103 | * |
| Effects on Decision Making | | |
| T2 Victimization -> T2 Expected benefits | .081 | ** |
| T1 Expected benefits -> T2 Expected benefits | .286 | ** |
| T1 Offending -> T2 Expected benefits | .049 | |
| T1 Victimization -> T2 Expected benefits | -.032 | † |
| T1 Risky leisure -> T2 Expected benefits | .051 | ** |
| T1 Substance use -> T2 Expected benefits | .145 | † |
| T1 Masculinity norms -> T2 Expected benefits | .037 | |
| T1 Anxiety and depression -> T2 Expected benefits | -.066 | ** |
| T1 Self-control -> T2 Expected benefits | .009 | |
| T1 Dominance -> T2 Expected benefits | .017 | |
| T1 Negative parenting -> T2 Expected benefits | .072 | |
| T1 Harsh discipline -> T2 Expected benefits | .053 | |
| T1 Negative school experiences -> T2 Expected benefits | -.051 | |
| T1 Grades -> T2 Expected benefits | -.008 | |
| Sex -> T2 Expected benefits | .245 | ** |
| Non Swiss -> T2 Expected benefits | .021 | |
| T1 SES -> T2 Expected benefits | -.001 | |

| | | |
|---|---|---|
| T2 Victimization -> T2 Risk retaliation | -.190 | † |
| T1 Risk retaliation -> T2 Risk retaliation | .245 | ** |
| T1 Offending -> T2 Risk retaliation | .139 | |
| T1 Victimization -> T2 Risk retaliation | -.069 | |
| T1 Risky leisure -> T2 Risk retaliation | -.300 | * |
| T1 Substance use -> T2 Risk retaliation | -.113 | |
| T1 Masculinity norms -> T2 Risk retaliation | .015 | |
| T1 Anxiety and depression -> T2 Risk retaliation | .153 | |
| T1 Self-control -> T2 Risk retaliation | -.550 | * |
| T1 Dominance -> T2 Risk retaliation | -.008 | |
| T1 Negative parenting -> T2 Risk retaliation | -.189 | |
| T1 Harsh discipline -> T2 Risk retaliation | -.036 | |
| T1 Negative school experiences -> T2 Risk retaliation | .092 | |
| T1 Grades -> T2 Risk retaliation | -.016 | |
| Sex -> T2 Risk retaliation | -.359 | † |
| Non Swiss -> T2 Risk retaliation | -.073 | |
| T1 SES -> T2 Risk retaliation | -.002 | |

Effect of Decision Making on Offending

| | | |
|---|---|---|
| T2 Expected benefits -> T3 Offending | .437 | ** |
| T2 Risk retaliation -> T3 Offending | -.055 | ** |
| T1 Offending -> T3 Offending | .211 | ** |
| T1 Victimization -> T3 Offending | .085 | † |
| T1 Risky leisure -> T3 Offending | -.014 | |
| T1 Substance use -> T3 Offending | .206 | |

| | | |
|---|---|---|
| T1 Masculinity norms -> T3 Offending | .105 | |
| T1 Anxiety and depression -> T3 Offending | -.025 | |
| T1 Self-control -> T3 Offending | .103 | |
| T1 Dominance -> T3 Offending | .060 | |
| T1 Negative parenting -> T3 Offending | -.181 | |
| T1 Harsh discipline -> T3 Offending | .158 | |
| T1 Negative school experiences -> T3 Offending | -.031 | |
| T1 Grades -> T3 Offending | -.109 | * |
| Sex -> T3 Offending | .551 | ** |
| Non Swiss -> T3 Offending | -.048 | |
| T1 SES -> T3 Offending | -.004 | |
| Indirect Effects | | |
| T2 Victimization -> T2 Expected benefits -> T3 Offending | .035 | ** |
| T2 Victimization -> T2 Retaliation risk -> T3 Offending | .010 | |

*ABBREVIATIONS*: B = Unstandardized Coefficients.

† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$ (two-tailed).